

Opener Question 3M

5) A function is described using the following information

$$\{x \in \mathbb{R} \mid 2 \leq x \leq 20\}$$

- State in words what this means
- Is this the function's domain or range

II $\begin{matrix} x & y \\ 1 & 2 \\ 2 & 3 \\ 3 & 4 \\ 4 & 5 \end{matrix}$ Is this a function? Why?

Feb 5-8:42 AM

Opener Question 3M

5) A function is described using the following information

$$\{x \in \mathbb{R} \mid 2 \leq x \leq 20\}$$

- State in words what this means *x is a set of real numbers such that x is greater or equal to 2 but less than or equal to 20*
- Is this the function's domain or range?

II $\begin{matrix} x & y \\ 1 & 2 \\ 2 & 3 \\ 3 & 4 \\ 4 & 5 \end{matrix}$ Is this a function? Why?

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1.2 Comparing Rates of Change

Linear vs Quadratic p 17

Linear-first differences are the same

Quadratic-second differences are the same

Linear

Quadratic

Linear: $\begin{matrix} x & y \\ 0 & 0 \\ 1 & 2 \\ 2 & 4 \\ 3 & 6 \\ 4 & 8 \end{matrix}$ $\Delta y = 2$ $y = mx + b$ Degree 1

Quadratic: $\begin{matrix} x & y \\ 0 & 0 \\ 1 & 1 \\ 2 & 4 \\ 3 & 9 \\ 4 & 16 \end{matrix}$ $\Delta y = 1, 3, 5, 7$ $\Delta^2 y = 2$ $y = ax^2 + bx + c$ Degree 2

Function Notation

State the Dependent Variable in terms of the Independent Variable

i.e. $y = 3x$

$f(x) = 3x$

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EXAMPLE 2 Representing volume as a function of time

Water is poured into a tank at a constant rate. The volume of water in the tank is measured every minute until the tank is full. The measurements are recorded in the table.

Time (min)	0	1	2	3	4	5	6	7
Volume (L)	0.0	1.3	2.6	3.9	5.2	6.5	7.8	9.1

- Use difference tables to determine whether the volume of water poured into the tank, $V(t)$, is a linear or quadratic function of time. Explain.
- Sketch the function and range using interpolation.

$\begin{matrix} x & y \\ 0 & 0 \\ 1 & 1.3 \\ 2 & 2.6 \\ 3 & 3.9 \\ 4 & 5.2 \\ 5 & 6.5 \\ 6 & 7.8 \\ 7 & 9.1 \end{matrix}$ $\Delta y = 1.3$ Linear Function Degree = 1 First Differences the Same

Example #2 p 21

$$y = 1.3x$$

$$V(t) = 1.3t$$

$$D = \{t \in \mathbb{R} \mid 0 \leq t \leq 7\}$$

$$R = \{V \in \mathbb{R} \mid 0 \leq V \leq 9.1\}$$

Volume = V

$$V(t) = 1.3t$$

Sep 6-1:44 PM

Hmk p 24, 25 2, 1, 2, 4, 6, 7, 8

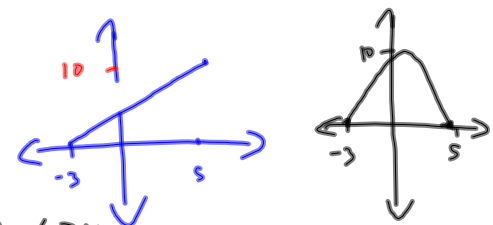
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$\begin{matrix} x & y \\ 0 & 0 \\ 0.1 & 0.16 \\ 0.2 & 0.64 \\ 0.3 & 1.44 \\ 0.4 & 2.56 \\ 0.5 & 4.00 \end{matrix}$ $\Delta y = 0.16, 0.48, 0.80, 1.12, 1.44$ $\Delta^2 y = 0.32$

Feb 10-10:10 AM

Degree - Quad or Lin
 6 a) $f(x) = -4x(x-1) - x$
 $f(x) = -4x^2 + 4x - x$
 $f(x) = -4x^2 + 3x$
 Degree = 2
 \therefore Quadratic
 Review Ques -
 P37 21-5
 P70 21-3

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 $f(x) = 60x$
 $f(30) = 60(30)$
 $f(30) = 1800$
 $60 \times 30 = 1800$
 $D = \{x \in \mathbb{W} \mid 0 \leq x \leq 60\}$
 $R = \{f(x) \in \mathbb{W} \mid 0 \leq f(x) \leq 3600\}$

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State the Degree
 $y = 3x(x+1)$
 $y = 3x^2 + 3x$
 Degree = 2
 $3x^4 + x^2 + 3$
 Degree = 4

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